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PATENT SPECIFICATION

632,222

Application Date : March 19, 1947 No. 7580/47.

Complete Specification Accepted : November 18, 1949.

Index at acceptance:—**Classes 18,** A4(c: e), A8(c1a: c1c: d), A9f(1: 2); **and 66,** B8, D(4: 7f1).

COMPLETE SPECIFICATION

Improvements in Paper Cartons

(A communication from abroad from FRANK D. PALMER, INCORPORATED, a Corporation organized and existing under the laws of the State of Illinois, United States of America, whose post office address is 528, North Western Avenue, City of Chicago, County of Cook, State of Illinois, United States of America.)

I, ALFRED AUGUSTUS THORNTON, a British Subject, of Napier House, 24—27, High Holborn, London, W.C.1, Chartered Patent Agent, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to paper cartons and, more particularly, to so-called bottles made of paper board and adapted to hold liquid, for example, milk.

The main objects of the invention are to provide a paper board carton or bottle which may be supplied to the dairy which packages the milk, in a flat blank form thereby facilitating the transportation and storage of the blanks; to provide a paper bottle construction which, when filled and closed may be delivered to the customer in such condition that when the bottle is to be opened for dispensing the content, the consumer will have available a dispensing or pouring opening arrangement which has theretofore never been opened and will, therefore, be as clean as it was when the carton was formed; to provide a paper bottle construction having an unusually sturdy and leak proof bottom arrangement; to provide a paper bottle having smooth, recess free outer and inner surfaces whereby the maintenance of cleanliness is facilitated.

The invention consists in a paper carton having substantially flush and unrecessed side, top and bottom walls, such top wall having relatively independent means which, when displaced, respectively provide filling and dispensing openings, and being formed by a pair of flaps which extend from oppositely disposed upper edge portions of the side walls and are folded inwardly, one over the other, the innermost of such flaps being provided with lines of weakness facilitating the removal therefrom of portions to provide the dispensing and filling openings respectively through said innermost flap, the outermost flap being provided with lines of weakness and hinge lines cooperating to provide in such outermost flap portions respectively overlying the said portions of the inner flap and displaceable by outwary folding movement about their respective hinge lines, said displaceable portions in the outermost flap being adhesively united to the respective underlying displaceably portions of the inner flap.

Referring now to the accompanying drawings:

Figure 1 is a plan of a blank which forms the main body of the improved bottle;

Figures 2, 3 and 4 are perspectives illustrating successive steps in the formation of a top of the bottle which includes dispensing and filling opening provisions;

Figure 5 is a section illustrating more or less diagrammatically the top end construction, and the manner of opening the bottle for internal coating and filling purposes;

Figure 6 is a perspective illustrating the bottle as it appears when filled and sealed;

Figure 7 is a perspective illustrating the bottom end of the bottle in an initially open and unfinished condition;

Figure 8 is a plan of a blank employed in forming the bottom closure of the bottle;

Figure 9 is a vertical section across the bottom portion of the bottle illustrating the completed structure;

Figures 10, 11 and 12 are perspectives illustrating successive steps in the formation of the bottom closure;

Figure 13 is a fragmentary bottom elevation of the bottle as it appears before certain flaps extending from the walls of the bottle are folded to closed position;

Figure 14 is a fragmentary section corresponding in part to Figure 13 but showing certain details on a somewhat larger scale; and

Figure 15 is an end elevation of the body portion of the blank in a partially formed but collapsed condition.

The construction embodies a main body blank 1 which is suitably creased to permit

[Price

folding of the blank into the form of a rectangular carton. The wall forming panels of the blank are first bent to form a tube, the end flap 2 of the blank being adhesively secured to the margin of the wall panel at the other end of the blank.

The bottom includes a blank member 3 (Figure 8) which is suitably creased to provide a central bottom area 4 and on each edge, inner and outer flaps 5 and 6. The ends of the inner flaps are connected by corner webs 7 which are also creased as indicated to permit them to fold easily thereby forming corner enlargements.

The bottom blank 3 is initially folded so as to cause the inner flanges 5 to extend upwardly (Figure 11) at an inclined angle from the edges of the bottom panel, the outer flanges 6 being ultimately folded to a substantially vertically downwardly extending position as represented in Figure 11.

In the conditions shown in Figure 11, the web 7 is folded downwardly somewhat and in the position shown in Figure 12, the web 7 is shown folded upon itself and located between end portions of the outer flanges 6.

When the blank 1 is initially creased, the crease lines are formed so that an inwardly extending rib-like projection 8 is formed in the inside corners of the tube formed from the blank.

When the bottom member is seated in the end of the tube as shown in Figure 7, the corner enlargement formed by the folded web element 7 will be more or less crammed into the rib projection 8 in the corner of the carton body and into the ends of the flanges 6 with the result that a solid, well filled leak proof corner is formed. The outer surface of the flanges 6 and, if desired, the inner marginal surfaces of the end portion of the body 1, are coated with adhesive and suitable jaws are applied to squeeze the flange 6 tightly against the end of the body 1 so as to adhesively unite the bottom member to the body member. Thermoplastic adhesive is preferably employed, the same being applied where desired when the blanks are made and permitted to dry and harden. When the parts of the bottle are assembled, heat may be applied (in addition to pressure) to reactivate the thermo-plastic material to render it adhesive.

The recess 9 formed between the flanges 5 and 6 (see Figure 9) facilitates the application of a pressure jaw to the inner surface of the flange 6 for the squeezing thereof against the adjacent portion of the body 1. After the bottom member 3 is secured in the end of the body 1, the end flaps 10, 10 and 11, 11 are folded inwardly and adhesively secured, preferably by means of thermo-plastic sealing material. The larger flaps 11, 11 are disposed outside of the flaps 10, 10 and are of such size as to cover the entire bottom area of the carton, thereby to provide a smooth or flush bottom.

The top end construction is shown in Figures 2 to 6 inclusive. As there shown, the top end is formed by turning inwardly short end flaps 12, 12 and then a full sized end flap 13. The side marginal portions of the flap 13 are adhesively united to the narrow flaps 12, this being readily accomplished since the narrow flaps 12 have a normal tendency to spring outwardly and are otherwise adequately supported by their respective walls. Thermo-plastic or other adhesive material may be applied to the outside surfaces of the flaps 12, 12 or to the corresponding inner marginal areas of the flap 13. Appropriate moistening, drying, pressure reactivating and cooling or setting means are used as may be required when the adhesive is employed.

After the flap 13 is folded inwardly, the top or outermost flap 14 is folded inwardly over the flap 13 and sealed thereto by any of the means already referred to for sealing purposes. Certain restricted areas are, however, to be maintained free of any adhesive.

The flap 13 is initially provided with a circular cut score 15 which completely severs the disc portion 16 from the flap 13 except for one or two very small and easily broken bonds 16*a* which may be left to facilitate handling of the structure. The flap 13 is also initially provided with cut scoring 17 which completely severs the keystone shaped portion 18 from the end wall except for one or two very small bonds, such as represented at 18*a*, which serve to temporarily hold the portion 18 in place.

The outer flap 14 is provided with a flap extension 19. The flap 14 is also provided with cut scoring 20 of more or less U-shaped form and a line of creasing 21 which permits the ear portion 22 defined by the scoring 20 and creasing 21 to be folded outwardly on the hinge line 21 as represented in Figures 4 and 5. Adhesive is applied either to the disc 16 or to the ear 22 in such a manner that when the parts are closed the disc 16 and ear 22 will be adhesively connected so strongly that when the ear 22 is folded outwardly as shown (Figure 4 or 5) the disc 16 will follow the ear to leave an opening 23 in the top wall of the carton. In applying adhesive, care is exercised to avoid any adhesive between the surface of the ear 22 which extends beyond the disc 16 so that said ear will not be adhesively secured to the underlying surface of the flap 13 around the hole 23.

The outer end flap 14 is also provided with parallel lines of perforated scoring 24, 24 which extend into the flap extension 19. The

ends of the perforated scoring 24 in the extension 19 are interconnected by perforated scoring 25 and a centrally located slit 26. The ends of the scoring 24 in the flap 14 are interconnected by creasing 27 which constitutes a fold line or hinge about which the more or less rectangular ear portion 28 may be folded outwardly. The ear 28 overlaps the portion 18 and is adhesively secured thereto so that when the ear 28 is folded outwardly the portion 18 will be pulled out of the end wall 13 and adhered to the ear 28 substantially as the disc 16 adheres to the ear 22. A wire staple 28*a* may be employed to additionally secure the ear 28 and portion 18 together if adhesive attachment is not considered sufficient. The ear 22 and disc 16 may also be additionally interconnected by such a staple if desired. Such staples may conveniently be applied when the end structure of the carton is formed on the mandrel, the latter being suitably grooved to serve as an anvil for the stapling operation.

The carton is formed on a mandrel, represented at 29 in Figure 5, the top end being formed first. After the various flaps are folded and adhesively united, a suitably arranged plunger 30 is moved upwardly to open the ear 22 and disc 16 thereby to provide a filling opening in the top end of the carton. The incipient carton is then removed from the mandrel and the bottom member, formed as already described, is then inserted and sealed in place, the bottom flaps being also folded over to complete the bottom construction.

The carton may then be subjected to a moisture proofing operation by immersing it in a bath of melted paraffin or the like which coats both the outside and inside of the carton, paraffin entering the carton through the filling opening 23 and surplus paraffin being ultimately drained out through the filling opening. The paraffin treatment serves also to effectively seal any leaks which might otherwise be present because of the perforated scoring 24 or other causes.

When the paraffin has set, the carton is in condition to be filled with milk which is done through the filling opening 23. After the carton is filled, the ear 22 with the disc 16 is closed. The coating of paraffin which has previously been applied will serve to provide a leak proof fit between the edges of the portions 16 and 22 which are in contact with complementary edges in the flaps 13 and 14, and the paraffin will also serve as a thermoplastic adhesive material which may be reactivated to fuse such portions together by the application of a small amount of heat in any suitable manner.

A seal 31 (Figure 6) is then applied over the ear portion 22, such seal being adhesively secured by a strong adhesive which will effectively hold the seal in place and resist removal, it being intended that the ear 22 should not be again opened. It has served its purpose and is not to be used for dispensing the contents of the container.

When the consumer receives the filled container, it is opened by prying out the ear portion 28, this being facilitated by the slit 26 which makes it easy to start the tearing of the score lines 25 and 24 to permit opening of the ear portion 28 about the hinge line 27. When the ear 28 is opened, the portion 18 from the inner flap 13 follows the ear 28 to leave a dispensing opening near one side wall of the carton as will be evident from inspection of Figure 6.

The bottom construction described provides a strongly reinforced and rigid bottom. The inserted bottom member 3 provides adequate area of engagement with the walls of the body of the bottle to insure a leak proof connection between these parts and the described folded corner web arrangement of the bottom insert insures the prevention of leaks at the bottom corners. The outer flaps 10 and 11 of the bottom structure serve to protect the bottom insert and further to provide a flush, recess-free bottom which will avoid the collection of dirt and other foreign matter.

The top construction with its separate filling and dispensing opening provisions results in the delivery to the consumer of a bottle which has its dispensing opening portions in their initial unbroken and unopened condition which imparts to the consumer strong assurance of cleanliness, especially around the dispensing opening, and the receipt of milk or other liquid in the same condition in which it was packaged.

The sealing of the filling opening closed by means of the seal 31, should be so effected that the seal 31 will be rather difficult to remove although this is not essential. In fact, the seal 31 may be wholly omitted since the cover portions 16 and 22 for the filling opening may be adequately sealed in closed condition by the means already indicated. The employment of the seal does, however, tend to direct the consumer to the dispensing opening and it provides a prominent place for opening instructions, warranties or other data.

After the dispensing opening has been opened, the portion 18 and ear 28 may be reclosed by merely folding these parts to their normal closed position. The portion 18 will then fit frictionally into its opening and the ear 28 into its opening, the slightly roughened inter-engagement edges resulting from the tearing of the score lines 24, 24 aiding to retain the portion 18 and the ear 28

in their closed positions. As shown, the dispensing opening is located in a somewhat more advantageous location than the filling opening for the purpose of pouring of the content of the bottle therefrom, i.e. somewhat nearer its adjacent container side than is the filling opening.

It will be observed that the paper bottle or carton presents smooth, recess free walls, both internally and externally. The absence of any reentrant angles on both the inside and outside of the carton aids materially in the delivery to the consumer of a clean, sanitary, and attractive package which is of substantial importance, especially in respect of packaged food products such as milk.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A paper carton having substantially flush and unrecessed side, top and bottom walls, such top wall having relatively independent means which, when displaced, respectively provide filling and dispensing openings, and being formed by a pair of flaps which extend from oppositely disposed upper edge portions of the side walls and are folded inwardly, one over the other, the innermost of such flaps being provided with lines of weakness facilitating the removal therefrom of portions to provide the dispensing and filling openings respectively through said innermost flap, the outermost flap being provided with lines of weakness and hinge lines cooperating to provide in such outermost flap portions respectively overlying the said portions of the inner flap and displaceable by outward folding movement about their respective hinge lines, said displaceable portions in the outermost flap being adhesively united to the respective underlying displaceable portions of the inner flap.

2. A paper carton according to Claim 1 wherein the outer flap displaceable portions are larger in area than the displaceable portions of the innermost flap and so arranged that the opening left in the innermost flap when either displaceable portion is removed will be bordered by a surrounding outside surface portion of said innermost flap which is exposed upon displacement of the respective displaceable portions of the outer flap.

3. A paper carton according to Claim 1 or 2 wherein the bottom wall consists in an inset bottom member having flange portions extending inwardly and then outwardly, the outwardly extending flange portions being spaced from the inwardly extending flange portions and united to the lower end marginal portions of said side walls, and one or more of the side walls being provided with flaps extending therefrom and foldable over said inset bottom member to cover the space between said inwardly and outwardly extending flanges.

4. A paper carton according to Claim 3 wherein the inwardly folded flange portions of the bottom inset member have corner enlargements which project between the adjacent ends of the outwardly folded flange members.

5. A paper carton according to any preceding claim in which the side walls are foldably connected to each other, such side walls being defined from each other by creases pressed inwardly of the body whereby inwardly projecting ribs are formed in the longitudinal interior corners of the body.

6. A paper carton according to Claim 4 or 5 wherein the corner enlargements of the bottom inset member are adapted to be wedged against the inwardly projecting ribs of the interior longitudinal corners of the side walls to thereby provide leak proof corner joints.

7. A paper carton according to any preceding claim wherein the paper bottle is of rectangular cross section.

8. A paper carton substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 19th day of March, 1947.

A. A. THORNTON & CO.,
Chartered Patent Agents,
Napier House, 24—27, High Holborn,
London, W.C.1,
For the Applicants.

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Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies, price 2s. 0d. each (inland) 2s. 1d. (abroad) may be obtained.

[This Drawing is a reproduction of the Original on a reduced scale.]

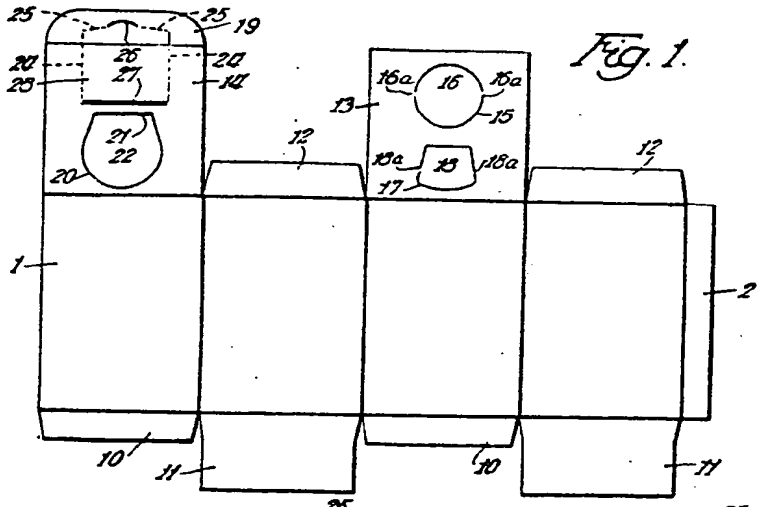


Fig. 1.

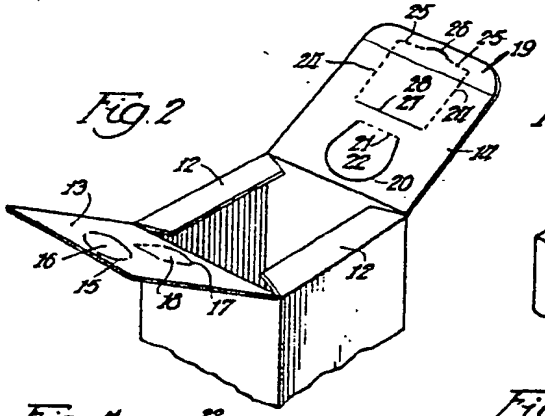


Fig. 2.

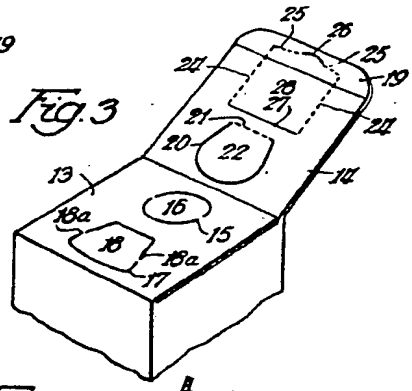


Fig. 3.

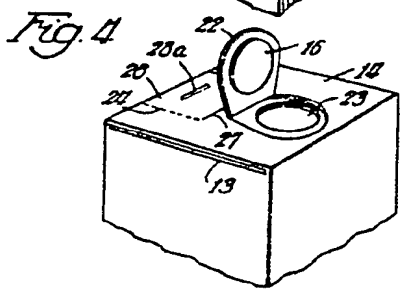


Fig. 4.

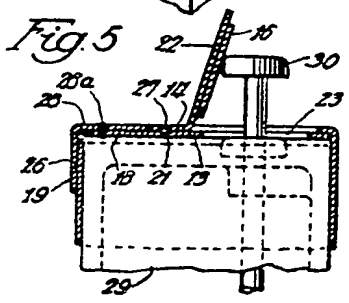
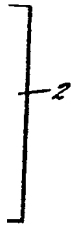
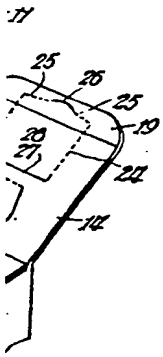


Fig. 5.





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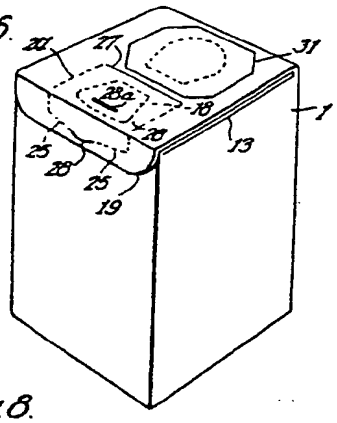


Fig. 7.

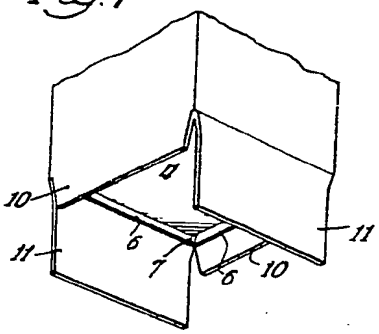


Fig. 8.

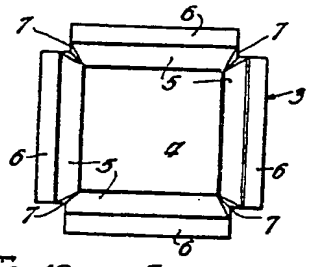


Fig. 9.

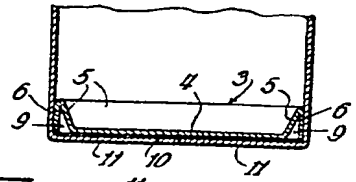


Fig. 10.

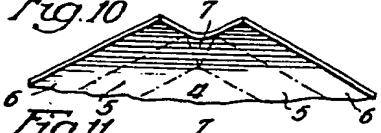
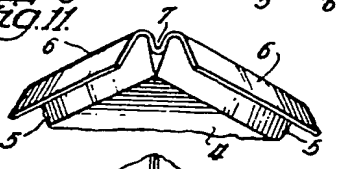


Fig. 11.



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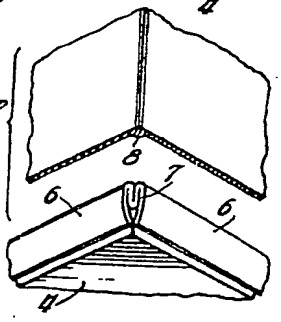

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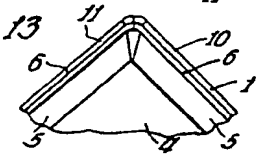

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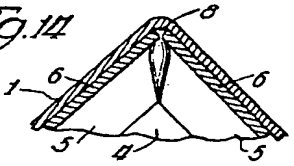

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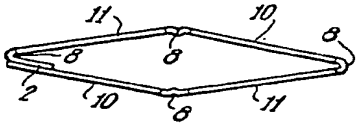

H.M.S.O. (Ty. P.)

632,222 COMPLETE SPECIFICATION

2 SHEETS

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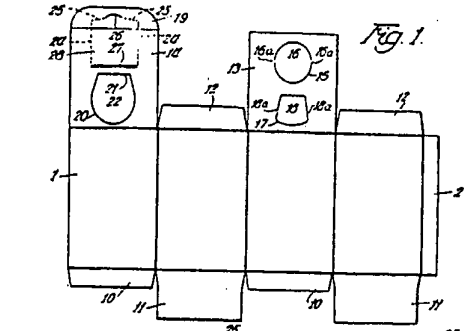


Fig. 1.

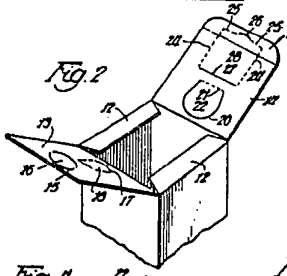


Fig. 2.

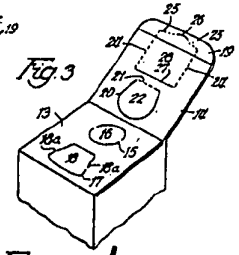
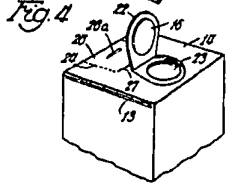


Fig. 3.



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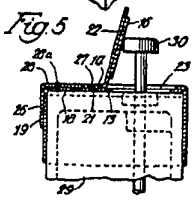

Fig. 5.

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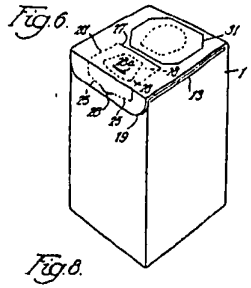

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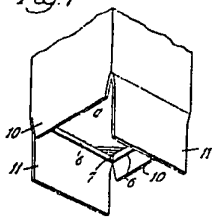

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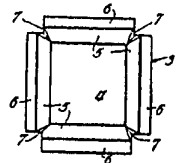

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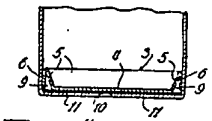
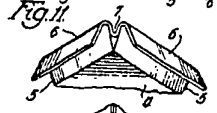


Fig. 9.

Fig. 10.



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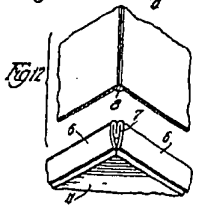

Fig. 12.

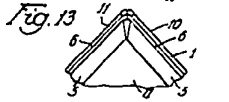

Fig. 13.

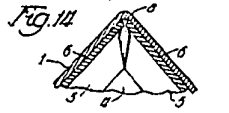

Fig. 14.

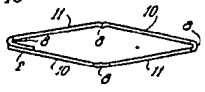

Fig. 15.

H.M.S.O.(Ty. P.)